SEXUALLY TRANSMITTED DISEASE MORBIDITY

1998

WASHINGTON STATE

INFECTIOUS DISEASE AND REPRODUCTIVE HEALTH:
STD/TB SERVICES AND IDRH ASSESSMENT UNIT

Sexually Transmitted Disease Morbidity ~ 1998
Washington State

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EXECUTIVE SUMMARY

The 1998 annual Sexually Transmitted Disease (STD) summary includes morbidity data and incidence rates for Washington State's legally reportable STDs. This includes gonorrhea, chlamydia, syphilis, herpes simplex-initial genital infection and neonatal, nongonococcal urethritis (NGU), acute pelvic inflammatory disease (PID) (not caused by gonorrhea or chlamydia), chancroid, lymphogranuloma venereum (LGV) and granuloma inguinale (GI). Sexually transmitted diseases are the most commonly reported communicable diseases in Washington State.

Chlamydia

In 1998, chlamydia was the most commonly reportable STD in Washington State. Reported cases totaled 10,997, yielding a statewide incidence rate of 192.5 per 100,000 population. Females continued to be selectively tested more frequently and, consequently, diagnosed at a higher rate than males. The statewide chlamydia incidence rate for females was 292.1 per 100,000, which was over three times the incidence rate for males--92.1 per 100,000. The 19% increase in chlamydia cases was attributable partly to changes to a more sensitive testing method at Washington clinical sites participating in the Region X Chlamydia Project.

Gonorrhea

In 1998, reported gonorrhea cases continued declining to an all-time low of 1,949 cases, yielding a statewide gonorrhea incidence rate of 34.1 per 100,000 population. Since gonorrhea screening is universal in all public STD clinics in Washington State, the gender-specific incidence rates may accurately reflect true disease incidence. The female gonorrhea rate was 30.1 per 100,000 and the male gonorrhea rate was 38.2 per 100,000 for the state as a whole. The slight 6% increase in the 1998 male gonorrhea rate was attributable to a gonorrhea outbreak among men who have sex with men in Seattle-King County.

Syphilis

Primary, secondary, and early cases of syphilis totaled 60 in 1998. The statewide syphilis rate was 1.1 per 100,000 population. When the 83 cases of late latent/late syphilis are included in this calculation, the statewide syphilis rate rises to 2.5 per 100,000. An outbreak of syphilis among men who have sex with men in Seattle more than doubled the number of primary and secondary cases statewide from 17 in 1997 to 44 in 1998.

Other STDs

In 1998, 1,812 cases of initial genital herpes (1086 male and 863 female) were reported, yielding an incidence rate of 31.7 per 100,000 population. Among males, there were 1,338 new cases of NGU reported; among females, 339 new cases of acute PID (that cannot be attributable to chlamydial or gonococcal infection) were reported. The gender-specific incidence rates for these diseases were 47.0 and 11.8 per 100,000, respectively. One rare case of chancroid was also reported in 1998. No cases of lymphogranuloma venereum (LGV) or granuloma inguinale (GI) were identified.

BACKGROUND

Data Sources and Methods

Confidential case reports completed by public and private health care providers and submitted by local health jurisdictions are the primary data source for reported cases of sexually transmitted diseases. Chlamydia, gonorrhea, and syphilis have to be accompanied by laboratory confirmation of positivity. Genital herpes, NGU and acute PID are reported without laboratory confirmation.

Because numerous persons and agencies submit confidential case reports, the quality and usefulness of specific data elements vary widely. Data elements, such as race, ethnicity, and marital status, are frequently missing and therefore, unreliable. Other data are almost completely reported, e.g.,, provider of care, age, sex, and county of residence. Beginning in 1998, the confidential database that houses STD case report information was modified to be dynamic, rather than static, allowing for case report information to be corrected or changed as new information on identified cases of STDs becomes available. Because of this change, the statistics reported in this report are for STD case information known as of January 14, 1999.

New features were added to the 1997 annual STD Morbidity report and are continued in this year's edition. A public health assessment data analysis program, VISTA, developed by the Seattle-King County Department of Public Health, was used to analyze most of the reported STD cases in 1998, including the calculation of incidence and age- and gender-specific incidence rates and their associated confidence intervals where appropriate. Brief interpretations of the data are presented as an introduction to the figures and tables for each STD. These summaries provide a context in which to understand that particular STD.

Terminology and Definitions

The intricacies of STD case identification and management require the reader to be familiar with some specific epidemiologic terms and surveillance criteria.

- Case - An episode of disease. If a person is diagnosed with more than one STD in a year, each infection is counted separately.

- Numerator - The upper portion of a fraction used to calculate a rate or a ratio, e.g., new cases identified and submitted by providers to local health jurisdictions and forwarded to the State Department of Health, STD/TB Services.

- Denominator - The lower portion of a fraction used to calculate a rate or ratio; usually, this is the mid-year population. The source for denominator data used in this report was: Washington State Adjusted Population Estimates, Department of Social and Health Services (DSHS), June 1997.

- Crude Rate - The number of events, e.g., reported cases, divided by the total mid-year population. This rate is not "adjusted" or "standardized" for different population characteristics. In general, no rates should be calculated if the number of events is fewer than five because the rates are considered unstable.

- Incidence Rate - The number of new cases of a disease (not persons) in a given year divided by the total mid-year population (age and sex appropriate) as a rate per 100,000 population. Incidence rates allow comparisons between two or more populations by standardizing the denominator and are the most appropriate statistic to use when investigating differences between groups. If the disease under study varies by age, age-adjusted incidence rates should be used to compare disease incidence between two or more populations. Incidence rates are not calculated for numerators of less than five cases, including zero cases, because the calculated rate is unreliable and subject to wide confidence intervals.

- Age-Specific Incidence Rate - A rate for a specified age group. The numerator, e.g., reported cases, and denominator, e.g., mid-year population, refer to the same age group. Age-specific incidence rates allow for the comparison of disease rates across age groups. If age is unknown, it is not included in the calculation of this rate. If the number of unknown data for age is greater than 2%, caution should be used in inference. This rate can also be calculated by gender to account for the different disease distribution for males and females.

- Confidence Interval - The confidence interval (CI) evaluates the influence of chance or random variability on the statistical estimate or rate (Selvin, 1996). Surveillance data, even based on complete counts, may be affected by chance. If variation in the occurrence of the disease is random and not affected by differential diagnosing or reporting, then confidence intervals may be calculated to facilitate comparisons over time, between groups, or between geographic locations (e.g., counties). In this situation, calculated confidence intervals should be based on a Poisson probability distribution. In general, if confidence intervals for two separate rates overlap, there is no statistically significant difference between the two rates.

  Narrow confidence intervals for rates indicate with greater certainty that the calculated rate is a reliable approximation of the true rate, while wide confidence intervals signal greater variability and less certainty that the calculated rate is a good estimate of the true rate.

A complete list of terminology and definitions can be found in the Glossary on pages 33-34.

Guidelines to Prevent Misuse of Data

Ready access to data by persons unfamiliar with the sources or unacquainted with epidemiology and statistics sometimes leads to misinterpretation or misrepresentation of information. This could result in inappropriate decision-making and misdirection of precious resources. The following guidelines may help prevent data misuse and should always be considered when reviewing data from any source:

1. Understand what you are looking at. What do the data cover? Do the data represent STD infections or persons with an STD? Do the numbers reflect new (incident) cases or cumulative numbers of cases? Are trends presented appropriately, using the same criteria for the numerator and denominator over the period of investigation?

2. Know the limitations of the data source. How is the information collected? How accurate and complete are the data? Do the data represent the general population or just a very select subgroup?

3. Do not over-interpret small changes. Small increases and decreases in numbers can look large if the baseline numbers are small to begin with. For example, if two cases of chlamydia are counted in a particular county in one year and three cases are counted in the next year, this is an increase of 50%. This may sound significant, but a change of one case is not. Caution is warranted.

4. Look for consistencies with other sources of information. Results for an investigation are more believable if they are supported by similar findings from other known studies. This does not mean that new findings should be ignored, but they may deserve a little more attention in establishing their conclusions.

In summary, data should never be taken at surface value. They should be closely scrutinized, analyzed, and placed into context before any decisions are made.

CHLAMYDIA

Chlamydia trachomatis is the most common reported bacterial STD in the United States. New estimates indicate approximately 3 million new infections each year (Kaiser Family Foundation, 1998). Most chlamydia infections in women, and many in men, are asymptomatic. Comprehensive screening, treatment, and partner notification of infected individuals have been shown to significantly reduce the prevalence of chlamydia infections.

Since 1988, Washington State has participated in chlamydia screening and prevalence monitoring activities through the federal Region X Chlamydia Project. All women attending STD clinics and women seeking reproductive health care in other facilities who meet selective screening criteria are the two populations targeted for chlamydia screening. Because genital tract infections with chlamydia are a major cause of pelvic inflammatory disease (PID), ectopic pregnancy and infertility among women, the Region X Chlamydia Project is directed at the female population. Active disease surveillance among women has resulted in higher rates of chlamydia incidence among this population. Recently, improved efforts for testing the male partners of infected women found through the Chlamydia Project have resulted in increased reporting of male cases. Also recently, a new, more sensitive testing method, ligase chain reaction or LCR, for detecting chlamydia infection in cervical specimens from women has been used at Washington State clinical sites participating in the Region X Chlamydia Project. In 1998, chlamydia (CT) cases identified through the project represented over one-third of all reported CT cases in Washington.

State-Level Chlamydia Trends

In 1998, there were 10,997 cases of chlamydia reported to the state STD program, resulting in a statewide incidence rate of 192.5 per 100,000 persons (Figure 1). The number of cases increased by 1,474 cases (15%) over the 1997 total and the state chlamydia incidence rate in 1998 jumped 13% from the previous year. An estimated 67% of the increase in reported chlamydia cases may be attributable to more sensitive testing methods.[1] Ten-year incidence trends for chlamydia in Washington State have shown a remarkable 40% decline in incidence from 274.6 cases per 100,000 persons in 1988 (the beginning of the Region X Chlamydia Project) to just 169.8 cases per 100,000 in 1997; however, this trend may be reversing with the higher incidence rate reported in 1998. The next two years will either confirm increasing chlamydia incidence or reveal that 1998 may have deviated from the expected trend. Even with the recent increase in incidence, the Washington State rate continues to be lower than the most recent national rate available (1997), 207.0 per 100,000.

In Washington State, 8,378 new cases of chlamydia among women yielded a female chlamydia rate of 292.1 per 100,000. This was a 14% increase over the number of cases and a 12% increase in the incidence rate among women reported in 1997. The highest age-specific rates among women were found in the 15-19 and 20-24 year old populations, 1,799.0 and 1,564.6 per 100,000 respectively (Figure 2). In 1998, there were three female cases of

[1] Assumptions: 1) LCR sensitivity was 90.9% and specificity was 99.5%; 2) prevalence remained constant between 1997 and 1998 at 4.75%; 3) the more sensitive testing methods available were also utilized by providers not participating in the Chlamydia Project who reported chlamydia cases.

chlamydia reported for every male case. These rates mirror national trends for chlamydia among women.

Reported male cases of chlamydia rose 19% to 2,619 new male cases in 1998. The male-specific incidence rate was 92.1 per 100,000 with the highest age-specific rate among males, 514.2 per 100,000, occurring in the 20-24 year old age group (Figure 2). The discrepancy in incidence between men and women is attributable to screening strategies that focus on women. An increase in the reporting of male cases may suggest that many of the sex partners of women with chlamydia are more frequently diagnosed and reported. However, some men diagnosed as having nongonococcal urethritis are treated, but frequently are not tested, for chlamydia. A large proportion of these men are infected with chlamydia, but they are not detected by surveillance systems based on laboratory reporting of positive chlamydia tests. These factors may still result in an under-reporting of chlamydia among men.

Providers who reported chlamydia cases in 1998 indicated that 62% of men were symptomatic for chlamydia, 34% of men were asymptomatic, and 3% of male cases had unknown symptomatology. Among women, 38% of cases were reported as symptomatic, 55% asymptomatic, and 4% had chlamydial pelvic inflammatory disease (PID). Men and women were treated with the same medications but differed in the frequency of their use. Among male cases of chlamydia, 50% were prescribed doxycycline, 46% azithromycin, and 14% some other drug (more than one drug was frequently given). Among female cases of chlamydia, the most frequently prescribed medication was azithromycin (51%). Doxycycline was indicated for 40% of the cases and some other drug was prescribed for 17% of female chlamydia cases.

Although chlamydia is a widely distributed STD among all racial and ethnic groups, the disparity in chlamydia incidence between groups persists in Washington State. Figure 3 presents chlamydia incidence rates by race and ethnicity for the last six years. Among Whites, chlamydia incidence declined overall between 1993-1998. However, chlamydia incidence trends among minority populations differed. After declining from 1993-1996, the chlamydia incidence rate among Blacks rose in 1998 to 1009.5 per 100,000 persons; this was almost nine times the rate of Whites. The chlamydia incidence trend among Hispanics paralleled the experience among Blacks with increased incidence from 341.4 per 100,000 in 1996 to 412.0 per 100,000 in 1998. The chlamydia incidence rate among Native Americans has also increased since 1995, reaching a five-year high of 376.5 per 100,000. The Asian chlamydia incidence rate over the past six years has remained relatively constant; incidence in 1998 was 168.1 per 100,000. However, caution is stronly advised when interpreting chlamydia incidence rates by race because a large proportion of cases was missing race or ethnicity data--19% missing race and 23% missing ethnicity information.

County-Level Chlamydia Trends

To assess the burden of disease and compare this burden across counties of differing population sizes, county-specific incidence rates were calculated (Figure 4). Thirty-six of Washington's 39 counties reported at least five cases of chlamydia. Figure 5 shows these county-specific incidence rates ranked from highest to lowest. Garfield county had the highest

incidence rate, 402.1 per 100,000, followed by Franklin, 287.0 per 100,000, Yakima, 284.4 per 100,000, and Walla Walla, 251.7 per 100,000. However, the largest number of chlamydia cases (3,485) was reported by King county. Due to under-diagnosing, under-reporting, and the asymptomatic nature of the disease, the chlamydia incidence rates are considered conservative, making county-to-county comparisons difficult.

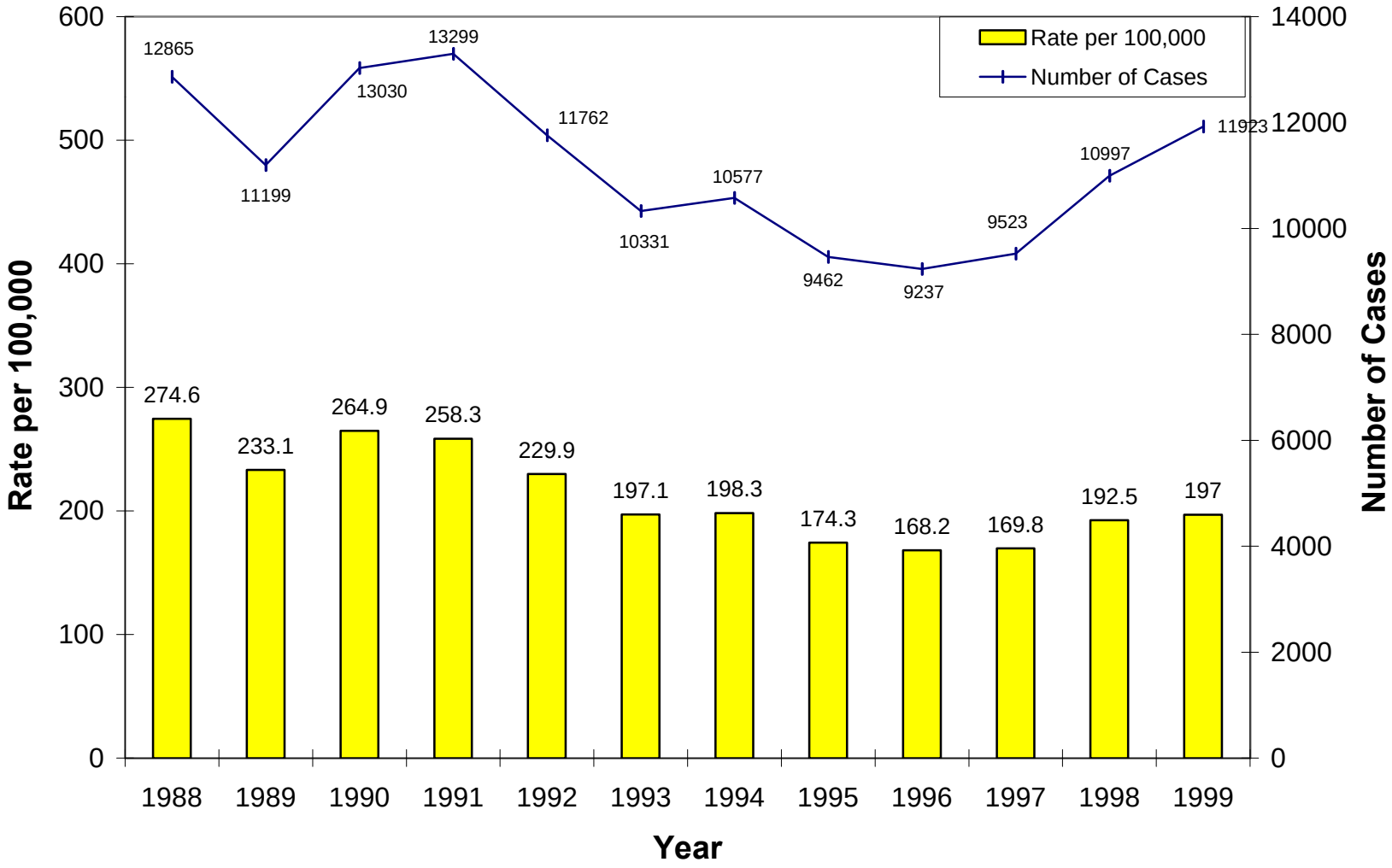
County-level chlamydia incidence rates for males and females are presented in Table 1. King county had the largest number of male cases (1,055) and the highest male incidence rate (126.9 per 100,000). King county also had the largest number of female chlamydia cases (2,430); however, their incidence rate of 289.2 per 100,000 was ranked tenth among counties in Washington State. The highest county-specific incidence rate for chlamydia among women was Franklin County, 500.5 per 100,000.

In terms of differences in chlamydia incidence rates between age groups, the Region X Chlamydia Project has consistently shown that the highest rates of infection in women are in adolescents and young adults. During the past two decades, the age of initiation of sexual activity has steadily decreased and age at first marriage has increased, resulting in increases in premarital sexual experience among adolescent women and in an enlarging pool of young women at risk. There is also some evidence that younger females are more at risk of acquiring chlamydia if exposed because of the immaturity and friability of the cervix. Additional risk factors for adolescents include: frequent unprotected intercourse, biological susceptibility to infection, and obstacles to utilization of health care.

These risks are supported by 1998 Washington State county-specific data where persistently high rates of chlamydia were found among the 15-17, 18-19, and 20-24 year old age groups (Table 2). Among the 15-17 year old group, King county reported the largest number of chlamydia cases (603), but Franklin county had the highest incidence rate (1,484.8 per 100,000). For the 18-19 year old age group, King county also reported the largest number of cases (561), but Okanogan county had the highest incidence rate (2,447.2 per 100,000). Elevated chlamydia incidence rates continued into young adulthood with the largest number of cases (1,085) reported by King county and the highest incidence rate found in Yakima county (1,735.4 per 100,000).

STD prevention and education activities for these three age groups differ. For 15-17 year olds STD education occurs within a school-based setting. Most 18-19 year olds are not in high school, only about one-half are enrolled in higher education, and they are legally considered adults. Young adults 20-24 years old have passed this transitional adolescent period and are more likely to be either married or in stable relationships, which may reduce their risk for STDs. Consequently the messages and methods for STD prevention across these distinct ages groups should differ.

Figure 1. Reported Chlamydia Cases and Incidence Rates*, Washington State, 1988-1999



* This is the crude rate, not adjusted for age.

Numerator: Reported cases of chlamydia.
Denominator: Washington State Adjusted Population Estimates, DSHS, June 1997.

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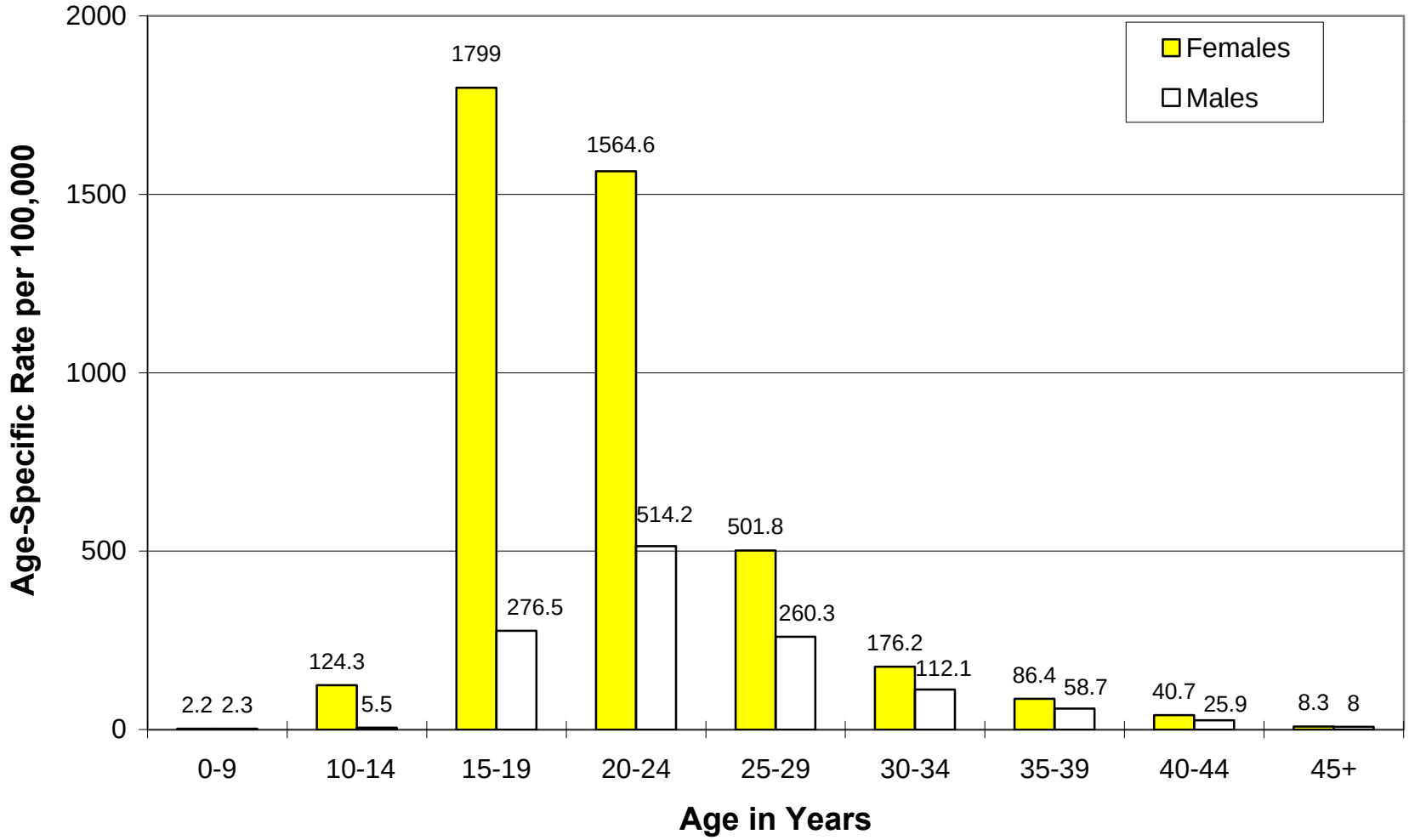
Figure 2. Age-Specific Chlamydia Incidence Rates* by Gender, Washington State, 1998



* Age missing for 240 (2.9%) female cases and 58 (2.2%) male cases and excluded from calculated rate.

Numerator: Reported cases of chlamydia.
Denominator: Washington State Adjusted Population Estimates, DSHS, June 1997.

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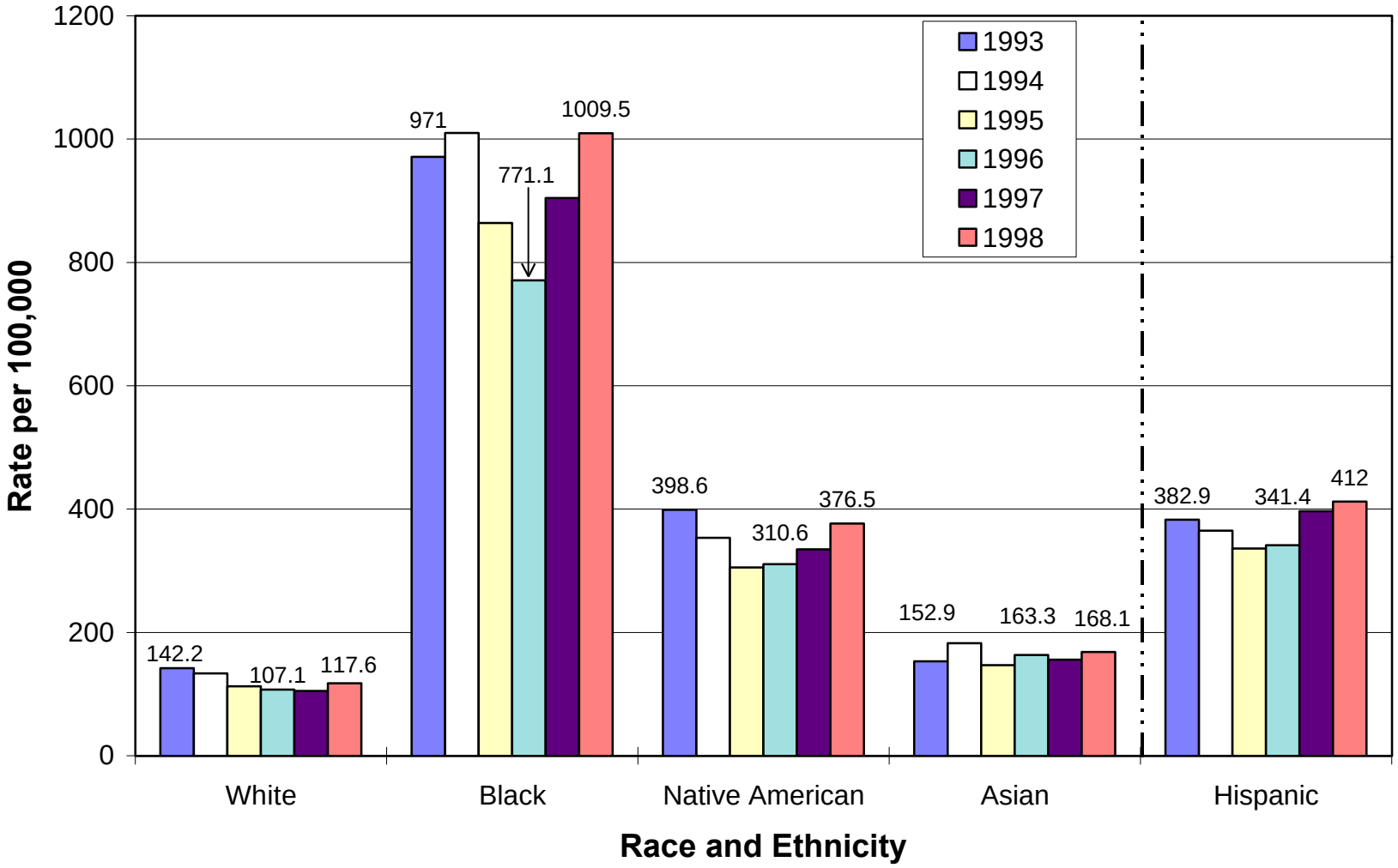
Figure 3. Chlamydia Incidence Rates* by Race**, Washington State, 1993-1998



* This is the crude rate, not adjusted for age. Race data missing for 19% of cases; ethnicity data missing for 23% of cases. Because of missing data, comparisons between races/ethnicities is not advised.

** Race and ethnicity counted separately, e.g. a case can be both "White" and "Hispanic."

Numerator: Reported cases of chlamydia where race and ethnicity is known.
Denominator: Washington State Adjusted Population Estimates, DSHS, June 1997.

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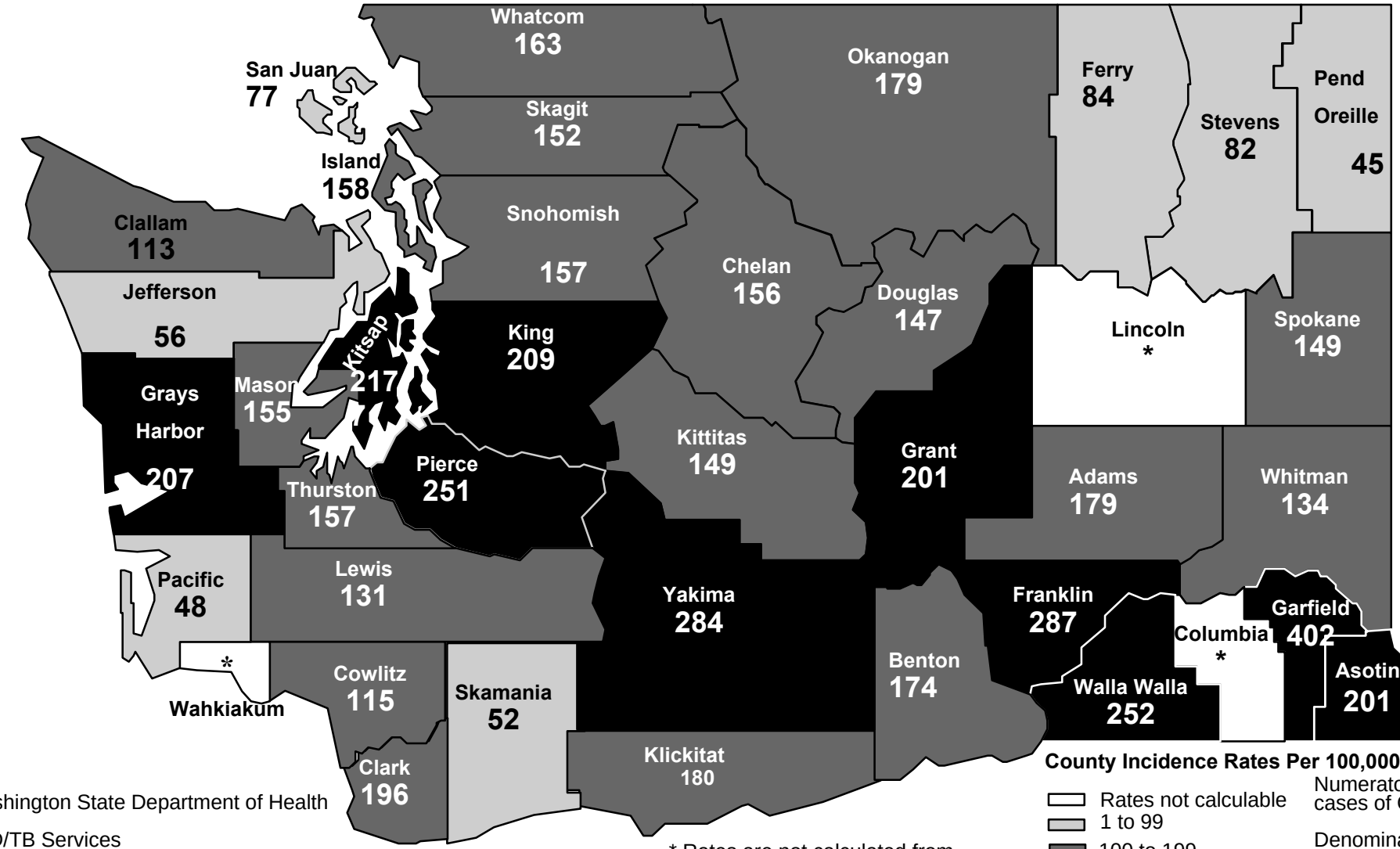
Figure 4. Chlamydia Incidence Rates By County

Washington State/ 1998



County Incidence Rates Per 100,000

- Rates not calculable
- 1 to 99
- 100 to 199
- 200 or Greater

Numerator: Reported cases of Chlamydia

Denominator: Washington State Adjusted Population Estimates, DSHS, 1997

* Rates are not calculated from 0 to 4 cases because they are unreliable.

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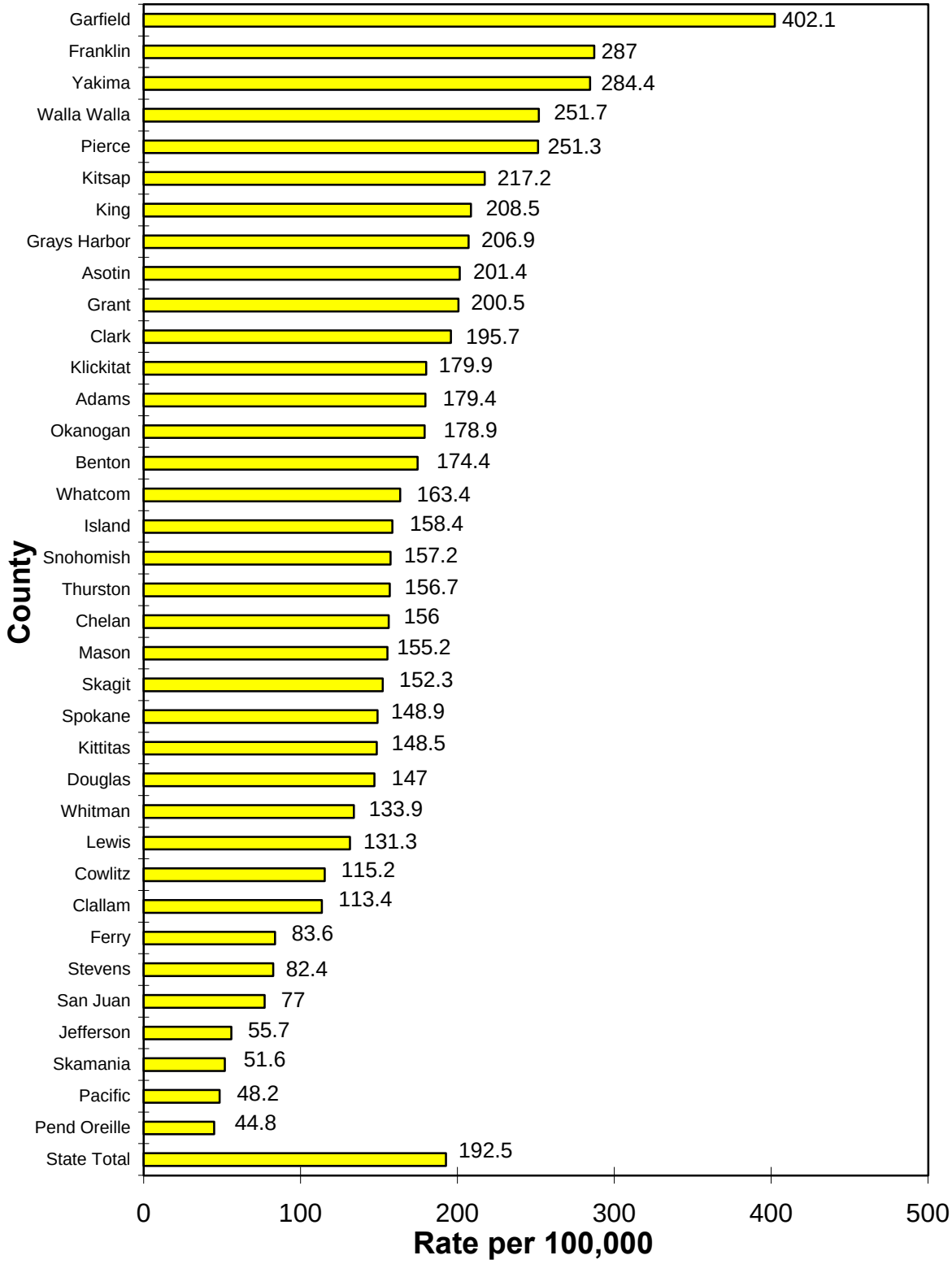
Figure 5. Chlamydia Incidence Rates* by County, Washington State, 1998 Ranked from Highest to Lowest



* This is the crude rate, not adjusted for age. Counties with fewer than 5 cases not shown.

Numerator: Reported cases of chlamydia.
Denominator: Washington State Adjusted Population Estimates, DSHS, June 1997.

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STATE OF WASHINGTON
STD MORBIDITY REPORT - 1998
REPORTED CHLAMYDIA CASES AND INCIDENCE RATES
BY SEX AND COUNTY

Table 1

	1998 POPULATION		CHLAMYDIA			
COUNTY	**MALE**	**FEMALE**	**MALE**	**RATE/100,000**	**FEMALE**	**RATE/100,000**
Adams	7,521	7,533	6	80	21	279
Asotin	9,554	10,303	11	115	29	282
Benton	69,860	71,193	44	63	202	284
Chelan	31,143	32,333	23	74	76	235
Clallam	32,702	33,422	6	18	69	207
Clark	154,065	158,604	165	107	447	282
Columbia	1,967	2,053	0	*	1	*
Cowlitz	45,908	46,968	13	28	94	200
Douglas	15,537	15,759	11	71	35	222
Ferry	3,672	3,505	1	*	5	143
Franklin	24,066	22,976	20	83	115	501
Garfield	1,102	1,136	4	*	5	440
Grant	34,725	35,088	13	37	127	362
Grays Harbor	35,128	34,471	33	94	111	322
Island	38,075	35,785	36	95	81	226
Jefferson	13,459	13,451	4	*	11	82
King	831,538	840,195	1,055	127	2,430	289
Kitsap	120,415	116,182	107	89	407	350
Kittitas	15,278	15,698	10	66	36	229
Klickitat	9,204	9,140	6	65	27	295
Lewis	33,493	34,281	10	30	79	230
Lincoln	4,522	4,464	1	*	2	*
Mason	24,345	23,336	22	90	52	223
Okanogan	18,622	18,831	14	75	53	282
Pacific	10,218	10,547	2	*	8	76
Pend Oreille	5,546	5,609	1	*	4	*
Pierce	353,582	350,054	408	115	1,360	389
San Juan	6,431	6,549	1	*	9	137
Skagit	48,852	50,323	25	51	126	250
Skamania	4,793	4,895	2	*	3	*
Snohomish	280,752	284,132	189	67	699	246
Spokane	206,502	211,189	126	61	496	235
Stevens	18,172	18,255	5	28	25	137
Thurston	100,493	104,963	49	49	273	260
Wahkiakum	1,894	1,892	0	*	3	*
Walla Walla	27,716	26,720	34	123	103	386
Whatcom	78,168	80,344	59	76	200	249
Whitman	20,825	19,500	18	86	36	185
Yakima	105,148	106,865	85	81	518	485
STATE TOTAL	**2,844,993**	**2,868,544**	**2,619**	**92**	**8,378**	**292**

*Rates are not calculated from 0 to 4 cases because they are unreliable

STATE OF WASHINGTON
STD MORBIDITY REPORT - 1998
REPORTED CHLAMYDIA CASES AND INCIDENCE RATES
BY AGE (15-24 YEARS) AND COUNTY

Table 2

	1998 POPULATION			CHLAMYDIA					
COUNTY	**15-17**	**18-19**	**20-24**	**15-17**	**RATE/100,00**	**18-19**	**RATE/100,00**	**20-24**	**RATE/100,000**
Adams	861	370	811	5	581	5	1,351	6	740
Asotin	962	446	986	11	1,144	9	2,018	12	1,217
Benton	6,908	3,572	7,255	58	840	58	1,624	79	1,089
Chelan	2,757	1,585	2,902	25	907	21	1,325	24	827
Clallam	2,696	1,401	3,008	23	853	15	1,071	22	731
Clark	14,419	8,003	17,990	145	1,006	125	1,562	174	967
Columbia	181	84	196	0	*	0	*	1	*
Cowlitz	3,996	2,473	4,574	18	451	21	849	29	634
Douglas	1,459	763	1,498	9	617	10	1,311	18	1202
Ferry	396	210	423	1	*	2	*	2	*
Franklin	2,492	1,375	2,655	37	1,485	27	1,964	43	1620
Garfield	142	14	90	3	*	2	*	2	*
Grant	3,369	1,831	3,623	27	801	37	2,021	42	1159
Grays Harbor	3,283	1,726	3,636	32	975	31	1,796	37	1018
Island	2,818	1,672	5,942	11	390	25	1,495	54	909
Jefferson	1,117	478	1,141	3	*	1	*	5	438
King	66,757	40,552	93,035	603	903	561	1,383	1085	1166
Kitsap	10,102	6,361	15,805	81	802	101	1,588	177	1120
Kittitas	1,486	2,465	4,711	2	*	8	325	31	658
Klickitat	930	405	903	9	968	9	2,222	8	886
Lewis	3,479	1,808	3,394	24	690	13	719	35	1031
Lincoln	489	127	369	0	*	1	*	1	*
Mason	2,285	1,146	2,645	26	1,138	18	1,571	14	529
Okanogan	1,907	899	1,858	12	629	22	2,447	14	754
Pacific	881	375	839	6	681	0	*	3	*
Pend Oreille	560	209	529	1	*	0	*	1	*
Pierce	29,633	21,208	51,604	292	985	358	1,688	622	1205
San Juan	560	138	470	6	1,071	0	*	0	*
Skagit	4,198	2,433	4,626	31	738	23	945	47	1016
Skamania	493	248	484	1	*	0	*	1	*
Snohomish	25,162	14,876	30,556	160	636	168	1,129	261	854
Spokane	18,398	12,636	29,200	86	467	141	1,116	223	764
Stevens	2,142	778	1,859	6	280	10	1,285	8	430
Thurston	9,244	5,462	11,553	52	563	60	1,099	121	1047
Wahkiakum	173	79	170	1	*	2	*	0	*
Walla Walla	2,502	2,404	4,494	28	1,119	21	874	50	1113
Whatcom	7,377	5,448	13,221	57	773	51	936	90	681
Whitman	1,279	4,308	9,013	2	*	14	325	31	344
Yakima	9,840	5,936	10,891	116	1,179	122	2,055	189	1735
STATE TOTAL	**247,733**	**156,304**	**348,959**	**2,010**	**811**	**2,092**	**1,338**	**3,562**	**1,021**

*Rates are not calculated from 0 to 4 cases because they are unreliable

GONORRHEA

Infections due to *Neisseria gonorrhoeae* remain a major cause of morbidity in the United States. Negative sequelae of gonorrhea include PID, tubal infertility, ectopic pregnancy, and chronic pelvic pain. Epidemiologic studies provide strong evidence that gonococcal infections facilitate HIV transmission, and biological studies have begun to elucidate the specific mechanisms through which this facilitation occurs.

State-Level Gonorrhea Trends

Data on gonorrhea from the Centers for Disease Control and Prevention (CDC) show the 1997 national gonorrhea incidence rate at its lowest since reporting began, 122.5 per 100,000 persons. National gonorrhea rates have precipitously declined from 1974 to the present. The United States, as a whole, is on the way to achieving the Healthy People Year 2000 goal of 100 per 100,000 for gonorrhea incidence. Paralleling national trends, the Washington State gonorrhea incidence has fallen 78% from 156.7 per 100,000 in 1988 to 34.1 per 100,000 in 1998 (Figure 6). Washington State experienced a three-fold decrease in the number of gonorrhea cases reported over the last 10 years, from 7,573 cases in 1988 to 1,949 cases in 1998. Disease control efforts and natural disease expression of gonorrhea (80% of men and 50% of women are estimated to be symptomatic) have been credited with the decreased disease burden across the United States and in Washington State.

Because most gonorrhea cases are symptomatic and seek medical care, reported cases are considered to be an accurate reflection of true disease incidence in the overall population. In 1998 the statewide male gonorrhea incidence rate was 38.2 per 100,000 and the female gonorrhea incidence rate was 30.1 per 100,000. An outbreak of gonorrhea in 1998 among men who have sex with men in Seattle-King County widened the incidence rate gap between the genders by increasing the number of cases of gonorrhea among men. The influence of the gonorrhea outbreak among MSM is illustrated by presenting gender-specific rates for King county versus all other counties. When excluding King county, the state male gonorrhea incidence rate was 21.6 per 100,000 and the state female gonorrhea incidence rate was 26.6 per 100,000. However, in King county, the male gonorrhea incidence rate was 78.3 per 100,000 and the female gonorrhea rate was 38.6 per 100,000.

Providers who reported gonorrhea cases in 1998 indicated that 89% of men were symptomatic for gonorrhea and 8% of men were asymptomatic. Among women, 49% of cases were reported as symptomatic, 37% asymptomatic, and 10% had gonococcal pelvic inflammatory disease (PID). Men and women were treated with the same medications, but differed in the frequency of their use. Among male cases of gonorrhea, 53% were prescribed cefixime, 41% doxycycline, 31% ceftiaxone, and 29% azithromycin (more than one drug was frequently given). Among female cases of gonorrhea, the most frequently prescribed medication was ceftiaxone (42%). Cefixime was indicated for 35% of the cases, doxycycline for 26%, and azithromycin for 19% of female cases. The prescription of drug therapy for chlamydia among gonorrhea cases reflects CDC treatment guidelines recommending presumptive treatment for chlamydia for all persons diagnosed with gonorrhea.

The age distribution of gonorrhea differs between males and females. Nationally, gonorrhea incidence for females peaks among 15-19 year olds and for males peaks among 20-24 year olds. However, in Washington State the peak 1998 age-specific gonorrhea incidence rates were shifted toward older age groups (Figure 7). Among women, the peak incidence, 169.3 per 100,000, was among 20-24 year olds. Peak gonorrhea incidence among men was found in the 25-29 year old age group, again reflecting the outbreak in Seattle among men who have sex with men (who also tend to be older than the average reported case of male gonorrhea). Another contributing factor to the different age distributions of gonorrhea incidence among men and women is the age gap between men and women in sexual relationships. Still others have noted that because chlamydia screening programs for women have expanded into younger populations, an indirect, beneficial effect on gonorrhea incidence has been increased detection. Any targeted intervention for gonorrhea should consider the impact of this disease on different age groups within both genders and direct the prevention message accordingly.

In Washington State, marked decreases in gonorrhea incidence have been seen across all racial and ethnic groups (Figure 8). The largest and most significant decrease has occurred among the African-American population, where the gonorrhea incidence rate has decreased 65% from 916.9 per 100,000 persons in 1993 to 324.2 per 100,000 in 1998. Even though this decrease is remarkable, racial disparities in disease burden continue to exist. The 1998 gonorrhea incidence rates among Hispanics (44.9 per 100,000), Native Americans (40.9 per 100,000), and Asians (15.1 per 100,000) were much closer to the rate among Whites (17.0 per 100,000) than the incidence rate among Blacks, which was 19 times higher than that of Whites. These same racial differences are also found in the 1997 national data for gonorrhea. In Washington State, 18% of reported cases of gonorrhea had missing race data and 20% of case reports were missing ethnicity data. Caution is strongly advised when interpreting gonorrhea incidence in minority populations.

County-Level Gonorrhea Trends

The distribution of gonorrhea not only differs by gender, age, and race, as noted above, it also differs by geography. At the county-level, gonorrhea incidence impacts small and large counties differently (Figure 9). To assess the burden of disease and compare this burden across counties of differing population sizes, county-specific incidence rates were calculated with 95% confidence intervals. Figure 10 shows the county-specific incidence rates for gonorrhea ranked from highest to lowest. The highest gonorrhea incidence rate was found in King County, 58.3 per 100,000 persons. Pierce County was the only location with a similarly high gonorrhea incidence rate, 57.6 per 100,000. The rates in these two counties were statistically significantly higher than any other county-specific gonorrhea incidence rate in the state. Most counties had gonorrhea incidence rates that were not significantly different from each other. Even though the estimated rate for Kitsap, Franklin, Clark, Spokane, Snohomish, Okanogan, and Lewis counties ranged from a high of 30.4 per 100,000 to a low of 12.8 per 100,000 persons, these rates do not statistically differ from each other, as indicated by the overlapping confidence intervals in Figure 10.

To further illustrate the differences in gonorrhea disease burden across counties, gender-specific and age-specific rates for adolescents and young adults were calculated. Gonorrhea

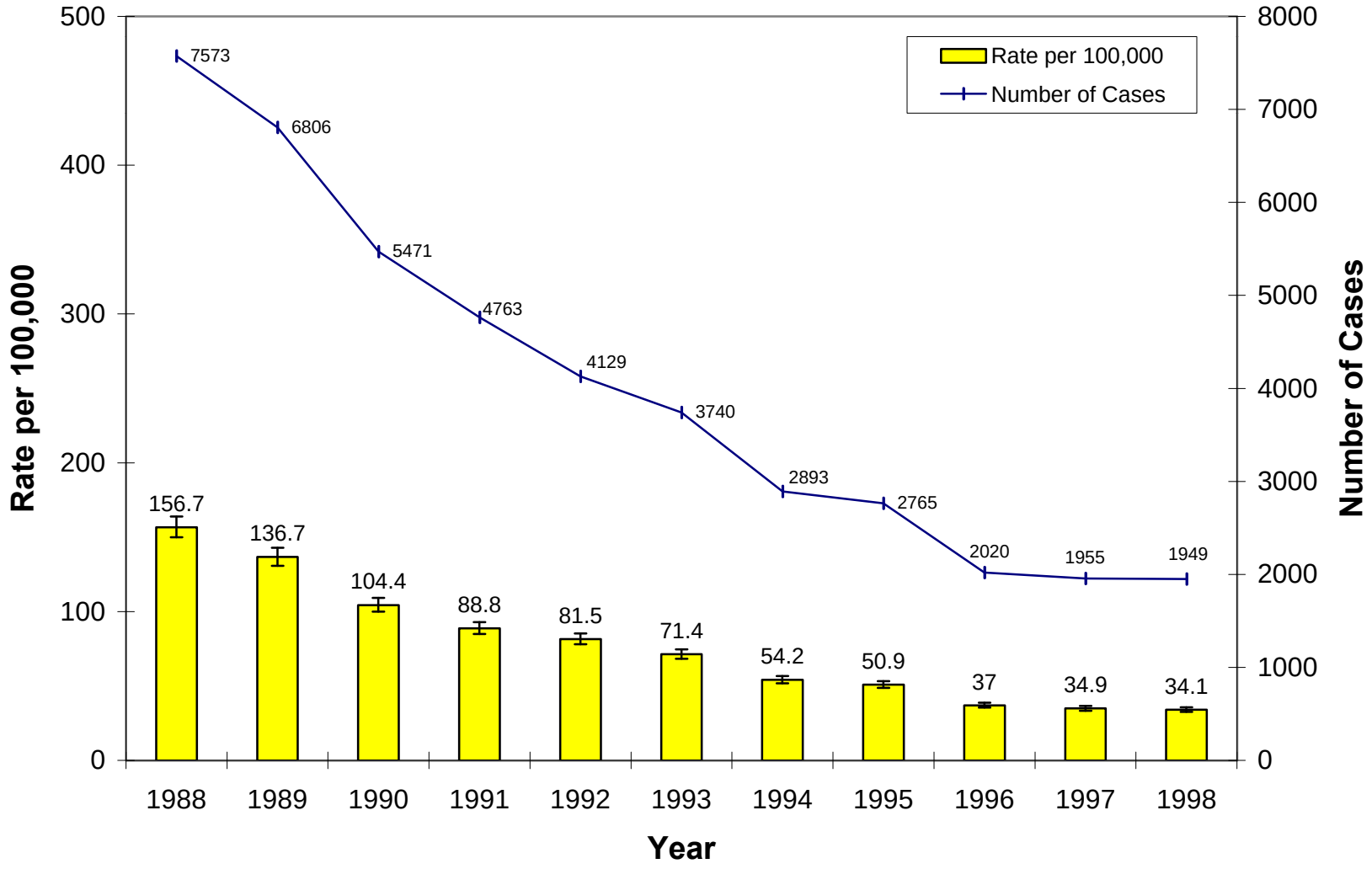
incidence rates for males and females by county are presented in Table 3. For most counties in Washington State, there were either no gonorrhea cases or too few cases to calculate a stable incidence rate by gender. Among the 15 counties with enough cases to allow calculation of a gender-specific incidence rate, King county had the largest number of male cases (651) and the highest male incidence rate, 78.3 per 100,000, in 1998. The second largest number of cases (182) and the second highest gonorrhea incidence rate for males (51.5 per 100,000) was found in Pierce county. King county also had the largest number of female gonorrhea cases (324); however, the female incidence rate of 38.6 per 100,000 ranked second behind the Pierce county female gonorrhea incidence rate of 63.7 per 100,000.

Because national data have consistently shown over the years that the highest incidence of gonorrhea and the highest risk for exposure is among adolescents and young adults, age-specific gonorrhea rates for 15-17, 18-19, and 20-24 year olds were calculated (Table 4). Many counties had only a few cases among these age groups, limiting the ability to calculate stable rates. In 1998, the highest incidence of gonorrhea (159.9 per 100,000) was among the 18-19 year old population. County-specific gonorrhea incidence rates for this population ranged from a low of 102.9 per 100,000 in Spokane county to a high of 344.2 per 100,000 in Pierce county. Pierce county also had the highest incidence rate for gonorrhea among 15-17 year olds, 192.4 per 100,000.

With the exception of King county, gonorrhea incidence in 1998 peaked among the adolescent population; however, young adults continued to be affected at rates higher than the statewide average (34.1 per 100,000). Statewide, gonorrhea incidence among 20-24 year olds (141.9 per 100,000 persons) was four times the overall state rate. The 20-24 year olds in King, Kitsap, and Pierce counties had gonorrhea incidence rates above the state average for that age group (Table 4).

Although the age-specific incidence rates among individuals 15-24 years old are five to seven times lower than national averages, the population continues to contribute disproportionately to gonorrhea incidence in Washington State. Statewide 47% of all reported gonorrhea cases are among these three age groups. This proportion is greater in some counties: 69% of Clark county's cases, 68% of Kitsap county's cases, and 64% of Pierce county's cases are attributable to the 15-24 year old population. Counties with a younger population distribution, such as Clark, or counties with a large military facility presence, such as Pierce and Kitsap, may contribute to the concentration of gonorrhea cases among 15-24 year olds. In an environment of shrinking resources, targeting of STD prevention programs to those populations at highest risk of infection, especially adolescents and young adults, is sound public health practice.

Figure 6. Reported Gonorrhea Cases and Incidence Rates* (95% CI)**, Washington State, 1988-1998



* This is the crude rate, not adjusted for age.
** 95% Confidence Intervals (CI) evaluate the influence of chance on the rate.

Numerator: Reported cases of gonorrhea.
Denominator: Washington State Adjusted Population Estimates, DSHS, June 1997.

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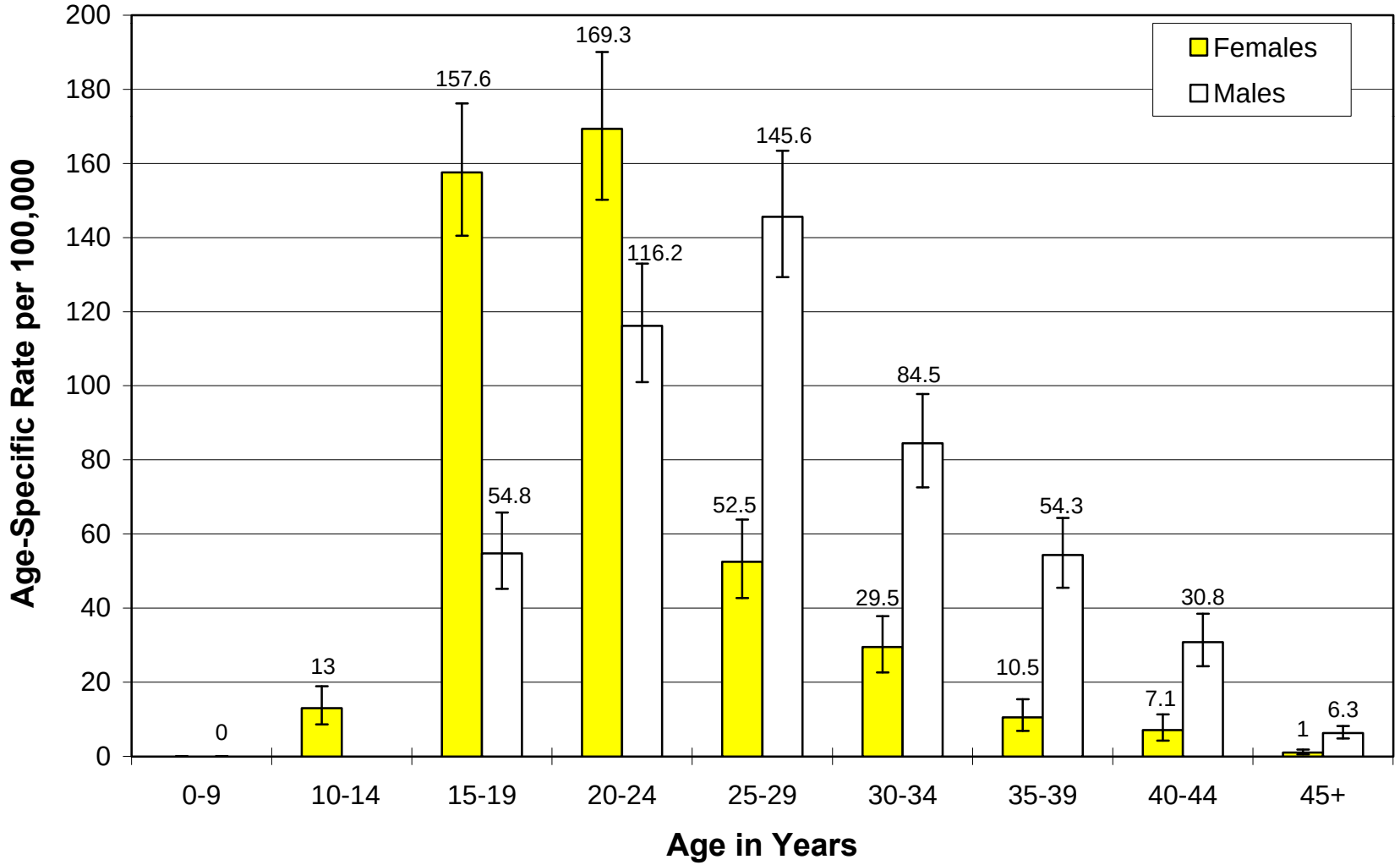
Figure 7. Age-Specific Gonorrhea Rates* (95% CI)** by Gender, Washington State, 1998



* Age missing for 25 (2.9%) female cases and 25 (2.3%) male cases and excluded from calculated rate.
** 95% Confidence Intervals (CI) evaluate the influence of chance on the rate.

Numerator: Reported cases of gonorrhea.
Denominator: Washington State Adjusted Population Estimates, DSHS, June 1997.

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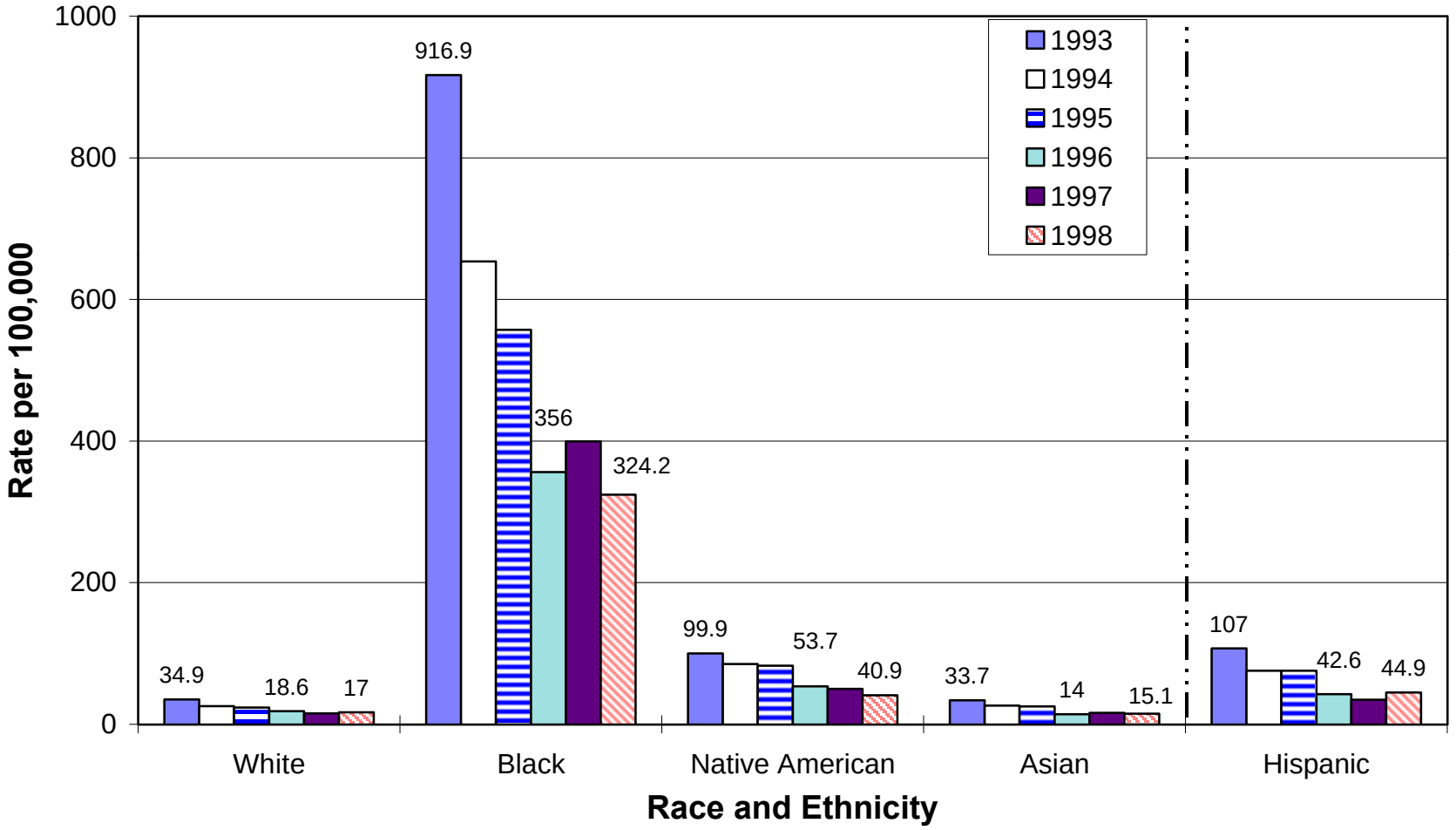
Figure 8. Gonorrhea Incidence Rates* by Race/Ethnicity**, Washington State, 1993-1998



* This is the crude rate, not adjusted for age. Race data missing for 18% of cases; ethnicity data missing for 20% of cases. Because of missing data, comparisons between races/ethnicities are not advised.

** Race and ethnicity counted separately, e.g. a case can be both "White" and "Hispanic."

Numerator: Reported cases of gonorrhea where race or ethnicity is known.
Denominator: Washington State Adjusted Population Estimates, DSHS, June 1997.

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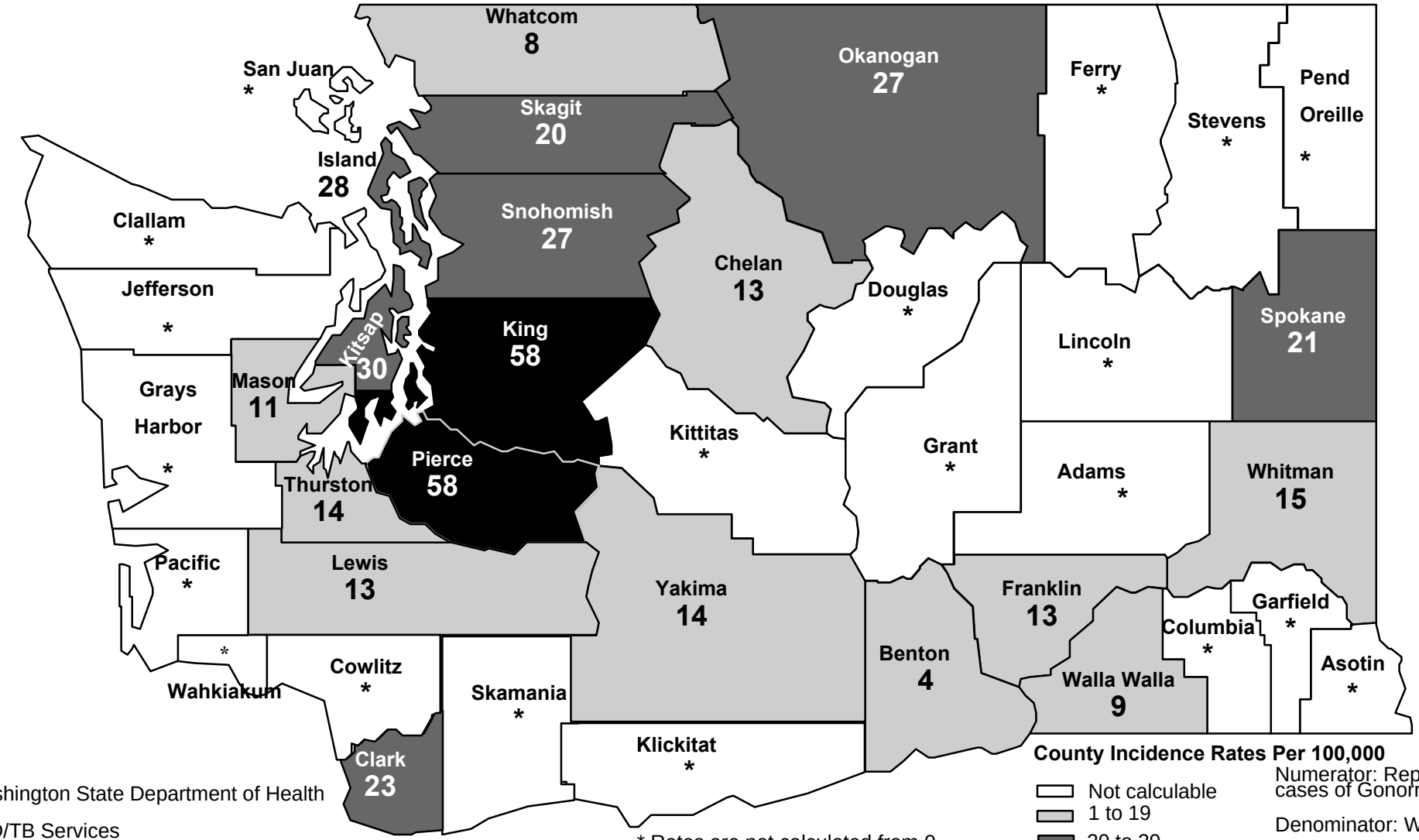
Figure 9. Gonorrhea Incidence Rates By County

Washington State/ 1998



County Incidence Rates Per 100,000

- Not calculable
- 1 to 19
- 20 to 39
- 40 or Greater

Numerator: Reported cases of Gonorrhea

Denominator: Washington State Adjusted Population Estimates,DSHS 1997

* Rates are not calculated from 0 to 4 cases because they are unreliable.

Washington State Department of Health

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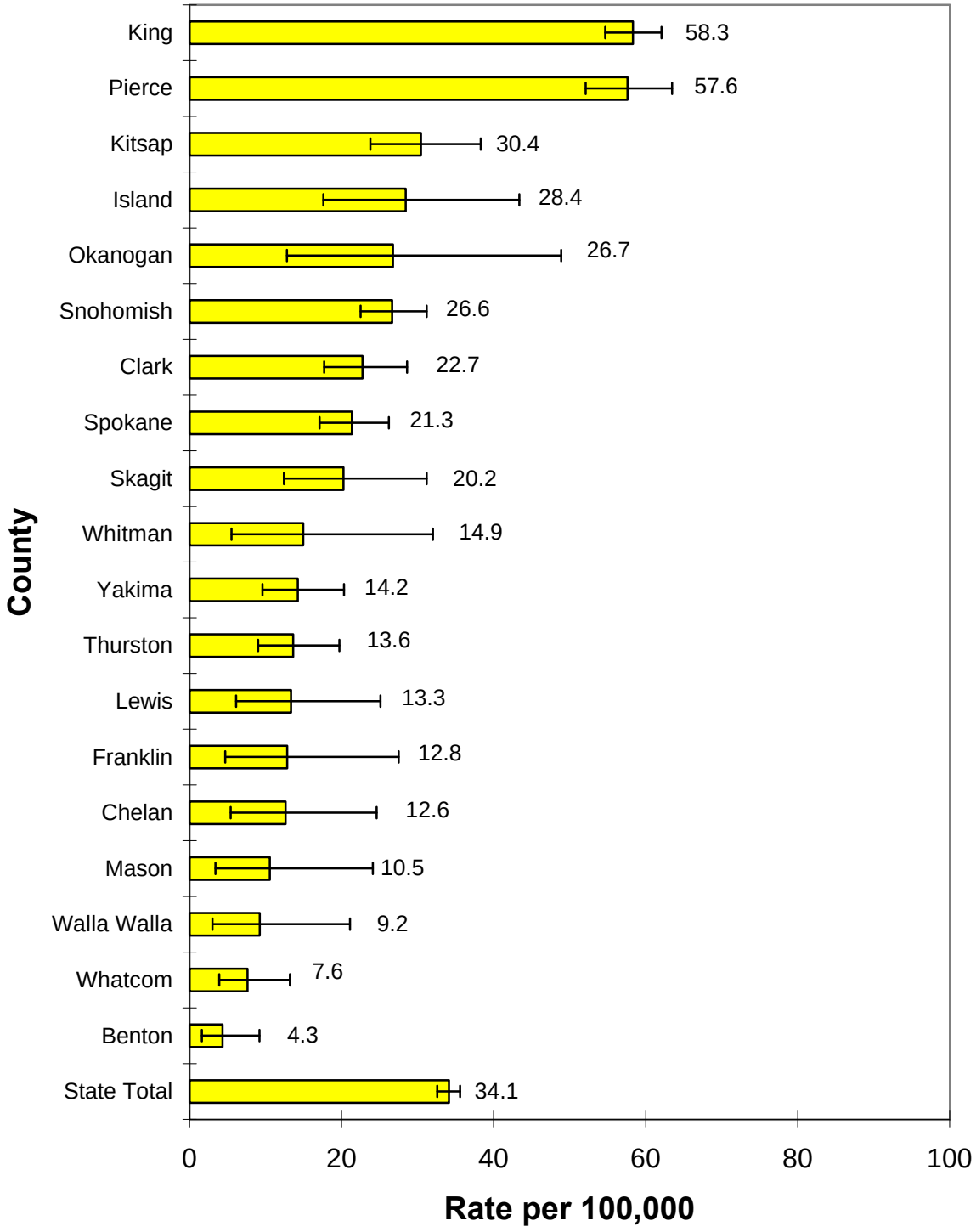
Figure 10. Gonorrhea Incidence Rates* (95% CI)** by County, Washington State, 1998 Ranked from Highest to Lowest



* This is the crude rate, not adjusted for age. Counties with fewer than 5 cases not shown.
** 95% Confidence Intervals (CI) evaluate the influence of chance on the rate.

Numerator: Reported cases of gonorrhea.
Denominator: Washington State Adjusted Population Estimates, DSHS, June 1997.

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STATE OF WASHINGTON
STD MORBIDITY REPORT - 1998
REPORTED GONORRHEA CASES AND INCIDENCE RATES
BY SEX AND COUNTY

Table 3

	1998 POPULATION		GONORRHEA			
COUNTY	**MALE**	**FEMALE**	**MALE**	**RATE/100,000**	**FEMALE**	**RATE/100,000**
Adams	7,521	7,533	1	*	0	*
Asotin	9,554	10,303	0	*	0	*
Benton	69,860	71,193	3	*	3	*
Chelan	31,143	32,333	4	*	4	*
Clallam	32,702	33,422	1	*	2	*
Clark	154,065	158,604	26	17	45	28
Columbia	1,967	2,053	0	*	1	*
Cowlitz	45,908	46,968	2	*	0	*
Douglas	15,537	15,759	0	*	0	*
Ferry	3,672	3,505	0	*	0	*
Franklin	24,066	22,976	2	*	4	*
Garfield	1,102	1,136	0	*	0	*
Grant	34,725	35,088	2	*	1	*
Grays Harbor	35,128	34,471	1	*	2	*
Island	38,075	35,785	13	34	8	22
Jefferson	13,459	13,451	2	*	0	*
King	831,538	840,195	651	78	324	39
Kitsap	120,415	116,182	35	29	37	32
Kittitas	15,278	15,698	0	*	0	*
Klickitat	9,204	9,140	0	*	0	*
Lewis	33,493	34,281	2	*	7	20
Lincoln	4,522	4,464	0	*	0	*
Mason	24,345	23,336	2	*	3	*
Okanogan	18,622	18,831	6	32	4	*
Pacific	10,218	10,547	1	*	2	*
Pend Oreille	5,546	5,609	0	*	2	*
Pierce	353,582	350,054	182	52	223	64
San Juan	6,431	6,549	1	*	0	*
Skagit	48,852	50,323	11	23	9	18
Skamania	4,793	4,895	0	*	0	*
Snohomish	280,752	284,132	64	23	86	30
Spokane	206,502	211,189	40	19	49	23
Stevens	18,172	18,255	0	*	0	*
Thurston	100,493	104,963	10	10	18	17
Wahkiakum	1,894	1,892	0	*	0	*
Walla Walla	27,716	26,720	3	*	2	*
Whatcom	78,168	80,344	6	8	6	8
Whitman	20,825	19,500	1	*	5	26
Yakima	105,148	106,865	14	13	16	15
STATE TOTAL	**2,844,993**	**2,868,544**	**1,086**	**38**	**863**	**30**

*Rates are not calculated from 0 to 4 cases because they are unreliable .

STATE OF WASHINGTON
STD MORBIDITY REPORT - 1998
REPORTED GONORRHEA CASES AND INCIDENCE RATES
BY AGE (15-24 YEARS) AND COUNTY

Table 4

	1998 POPULATION			GONORRHEA					
COUNTY	**15-17**	**18-19**	**20-24**	**15-17**	**RATE/100,000**	**18-19**	**RATE/100,00**	**20-24**	**RATE/100,000**
Adams	861	370	811	0	*	0	*	0	*
Asotin	962	446	986	0	*	0	*	0	*
Benton	6,908	3,572	7255	0	*	1	*	2	*
Chelan	2,757	1,585	2902	1	*	1	*	1	*
Clallam	2,696	1,401	3008	0	*	1	*	1	*
Clark	14,419	8,003	17990	9	62	15	187	25	139
Columbia	181	84	196	1	*	0	*	0	*
Cowlitz	3,996	2,473	4574	0	*	1	*	0	*
Douglas	1,459	763	1498	0	*	0	*	0	*
Ferry	396	210	423	0	*	0	*	0	*
Franklin	2,492	1,375	2655	0	*	2	*	3	*
Garfield	142	14	90	0	*	0	*	0	*
Grant	3,369	1,831	3623	0	*	0	*	3	*
Grays Harbor	3,283	1,726	3636	1	*	0	*	2	*
Island	2,818	1,672	5942	0	*	0	*	8	135
Jefferson	1,117	478	1141	0	*	0	*	0	*
King	66,757	40,552	93035	53	79	82	202	205	220
Kitsap	10,102	6,361	15805	13	129	11	173	25	158
Kittitas	1,486	2,465	4711	0	*	0	*	0	*
Klickitat	930	405	903	0	*	0	*	0	*
Lewis	3,479	1,808	3394	2	*	2	*	2	*
Lincoln	489	127	369	0	*	0	*	0	*
Mason	2,285	1,146	2645	2	*	2	*	0	*
Okanogan	1,907	899	1858	0	*	1	*	4	*
Pacific	881	375	839	0	*	0	*	3	*
Pend Oreille	560	209	529	1	*	0	*	1	*
Pierce	29,633	21,208	51604	57	192	73	344	130	252
San Juan	560	138	470	0	*	0	*	0	*
Skagit	4,198	2,433	4626	2	*	4	*	3	*
Skamania	493	248	484	0	*	0	*	0	*
Snohomish	25,162	14,876	30556	13	52	20	134	25	82
Spokane	18,398	12,636	29200	10	54	13	103	29	99
Stevens	2,142	778	1859	0	*	0	*	0	*
Thurston	9,244	5,462	11553	2	*	7	128	9	78
Wahkiakum	173	79	170	0	*	0	*	0	*
Walla Walla	2,502	2,404	4494	0	*	1	*	2	*
Whatcom	7,377	5,448	13221	1	*	1	*	5	38
Whitman	1,279	4,308	9013	0	*	2	*	3	*
Yakima	9,840	5,936	10891	5	51	10	169	4	*
STATE TOTAL	**247,733**	**156,304**	**348,959**	**173**	**70**	**250**	**160**	**495**	**142**

*Rates are not calculated from 0 to 4 cases because they are unreliable.

OTHER STDs

Besides chlamydia and gonorrhea, there are seven additional STDs that are legally reportable to the state Department of Health. Syphilis, initial genital herpes infection, nongonococcal urethritis (NGU), acute pelvic inflammatory disease (PID), chancroid, lymphogranuloma venereum (LGV), and granuloma inguinale (GI) require reporting by health care providers.

Syphilis

The diagnosis of syphilis is divided into four stages--primary, secondary, early latent and late latent/late. An infected person who does not get treatment may infect others during the first two stages (primary, secondary). Early latent syphilis is defined as an infection which is less than one year old and can be infectious if a secondary relapse occurs. In the late latent/late stage, untreated syphilis, although not contagious, can cause serious heart abnormalities, mental disorders, blindness, other neurological problems, and death.

All four stages of syphilis were reported in Washington State last year. Primary and secondary (P&S) syphilis are considered fairly rare in our state: in 1996, nine P&S syphilis cases (one in King county) were reported and 17 cases (11 of which were in King county) were reported in 1997. In 1998, there were 44 cases of P&S syphilis reported, almost tripling the number of cases reported from the previous year and increasing the state P&S syphilis incidence rate from 0.3 per 100,000 to 0.8 per 100,000. King county reported 33 cases of P&S syphilis, which is 75% of all cases reported this year and almost double the P&S syphilis cases King county reported last year. A cluster outbreak of this disease among men who have sex with men in Seattle was the principal reason for the increase and King county has reported that this outbreak continues into 1999 with some evidence of spreading to other counties. By contrast, one or two cases of P&S syphilis were reported in Pierce, Whitman, Clark, Island, Snohomish, Yakima, and Spokane counties (Figure 11). Even though Washington State is well below the national average of 4.3 per 100,000 for primary and secondary syphilis incidence, the near tripling of primary & secondary cases of syphilis last year and its concentration in Seattle with subsequent spread to other counties are good reasons for caution. This outbreak highlights the mobility of populations at-risk and illustrates that we, as a community, are still susceptible to increases in disease incidence which could have an enormous impact on county resources for STD control.

Early latent syphilis (n=16) was less widely distributed throughout the state with county-specific totals of eight cases in King, four cases in Yakima, two cases in Snohomish, and one case in each Mason and Clark county. The most common form of syphilis reported is late latent/late. Late latent/late cases of syphilis are old infections and not contagious. However, persons with old infections should still be treated so that they can be assured their latent infection will not cause long term complications. Table 5 presents the county-specific case totals for late latent/late syphilis. Only 14 counties in Washington State counties reported late latent/late syphilis cases; King county reported the most, 28 cases, followed by Pierce county, 15 cases, and Yakima county with 11 cases.

Syphilis infection during pregnancy may be transmitted to the fetus *in utero*. Congenitally acquired syphilis may result in fetal death or an infant born with physical and developmental disabilities. Nearly all cases of congenital syphilis are preventable through screening of pregnant women and early treatment during the prenatal period. Washington State law (RCW 70.24.090) requires physicians to test all pregnant women for syphilis during their first prenatal examination. There was one congenital syphilis case reported in Washington State in 1998 that resulted from an infected woman not receiving or electing not to receive prenatal care.

Nongonococcal Urethitis (NGU) and Pelvic Inflammatory Disease (PID)

There are two gender-specific STDs, both syndromes, reported in Washington State, NGU for men and acute PID for women (Figure 12). NGU cases totaled 1,338 in 1998; estimated incidence rate was 47 per 100,000 males. The statewide acute PID incidence rate for females was 11.8 per 100,000. Similar to other STDs in Washington State, NGU and acute PID cases are concentrated in the large, urban population centers of the state--King, Pierce, Snohomish, Clark, Kitsap, Spokane and Yakima counties (Table 5). Both diseases are suspected to be under-diagnosed and under-reported; therefore, caution should be used when interpreting these data.

Genital Herpes, Initial Infection

Washington State is one of a handful of states that has reporting of genital herpes. Only the initial infection is tracked in the state surveillance system. In 1998, 1,812 cases of initial herpes infection were reported (31.7 per 100,000 persons). Unlike chlamydia and gonorrhea, a suspected herpes infection does not require laboratory confirmation in order for the case to be reported to the state health department. Given recent CDC estimates of genital herpes prevalence in the United States (CDC, 1997), cases of initial genital herpes reported in Washington State are probably an underestimation of true incidence. The clinical nature of herpes infection and its manifestations makes it difficult to diagnose an initial episode. A latent infection may have mild expression, especially in women, and it may be only the most severe of herpes lesion outbreaks that compel people to seek health care for treatment. Among the reported cases of herpes in 1998, 80% stated that they sought care because they were experiencing symptoms. Caution should be used when interpreting reported herpes data for Washington State.

Others

Chancroid, LGV, and GI are very rare STDs. Only 19 states reported any cases of chancroid in 1997, with four states reporting 85% of the total 243 cases. One chancroid case was reported in Washington State in 1996, two in 1997, and one case was reported in 1998. The only reference laboratory in the United States that performs chancroid testing is located in Seattle. No cases of LGV or GI were reported in 1998.

Figure 11. Number of Primary and Secondary Syphilis Cases By County Washington State/ 1998

Washington State Department of Health

STD/TB Services

IDRH Assessment Unit

STATE OF WASHINGTON
STD MORBIDITY REPORT - 1998
REPORTED STD CASES AND INCIDENCE RATES BY DISEASE AND COUNTY

Table 5

		CHLAMYDIA			GONORRHEA		
COUNTY	**POPULATION**	**CASES**	**RATE/100,000**	**RANK**	**CASES**	**RATE/100,000**	**RANK**
Adams	15,054	27	179	13	1	*	*
Asotin	19,857	40	201	9	0	*	*
Benton	141,053	246	174	15	6	4	19
Chelan	63,476	99	156	20	8	13	14
Clallam	66,124	75	113	29	3	*	*
Clark	312,669	612	196	11	71	23	7
Columbia	4,020	1	*	*	1	*	*
Cowlitz	92,876	107	115	28	2	*	*
Douglas	31,296	46	147	25	0	*	*
Ferry	7,177	6	84	30	0	*	*
Franklin	47,042	135	287	2	6	13	13
Garfield	2,238	9	402	1	0	*	*
Grant	69,813	140	201	10	3	*	*
Grays Harbor	69,599	144	207	8	3	*	*
Island	73,860	117	158	17	21	28	4
Jefferson	26,910	15	56	33	2	*	*
King	1,671,733	3,485	209	7	975	58	1
Kitsap	236,597	514	217	6	72	30	3
Kittitas	30,976	46	149	23	0	*	*
Klickitat	18,344	33	180	12	0	*	*
Lewis	67,774	89	131	27	9	13	15
Lincoln	8,986	3	*	*	0	*	*
Mason	47,681	74	155	21	5	11	16
Okanogan	37,453	67	179	14	10	27	5
Pacific	20,765	10	48	35	3	*	*
Pend Oreille	11,155	5	45	36	2	*	*
Pierce	703,636	1,768	251	5	405	58	2
San Juan	12,980	10	77	32	1	*	*
Skagit	99,175	151	152	22	20	20	9
Skamania	9,688	5	52	34	0	*	*
Snohomish	564,884	888	157	18	150	27	6
Spokane	417,691	622	149	24	89	21	8
Stevens	36,427	30	82	31	0	*	*
Thurston	205,456	322	157	19	28	14	12
Wahkiakum	3,786	3	*	*	0	*	
Walla Walla	54,436	137	252	4	5	9	17
Whatcom	158,512	259	163	16	12	8	18
Whitman	40,325	54	134	26	6	15	10
Yakima	212,013	603	284	3	30	14	11
STATE TOTAL	**5,713,537**	**10,997**	**193**		**1,949**	**34**	

* *Rates are not calculated from 0 to 4 cases because they are unreliable

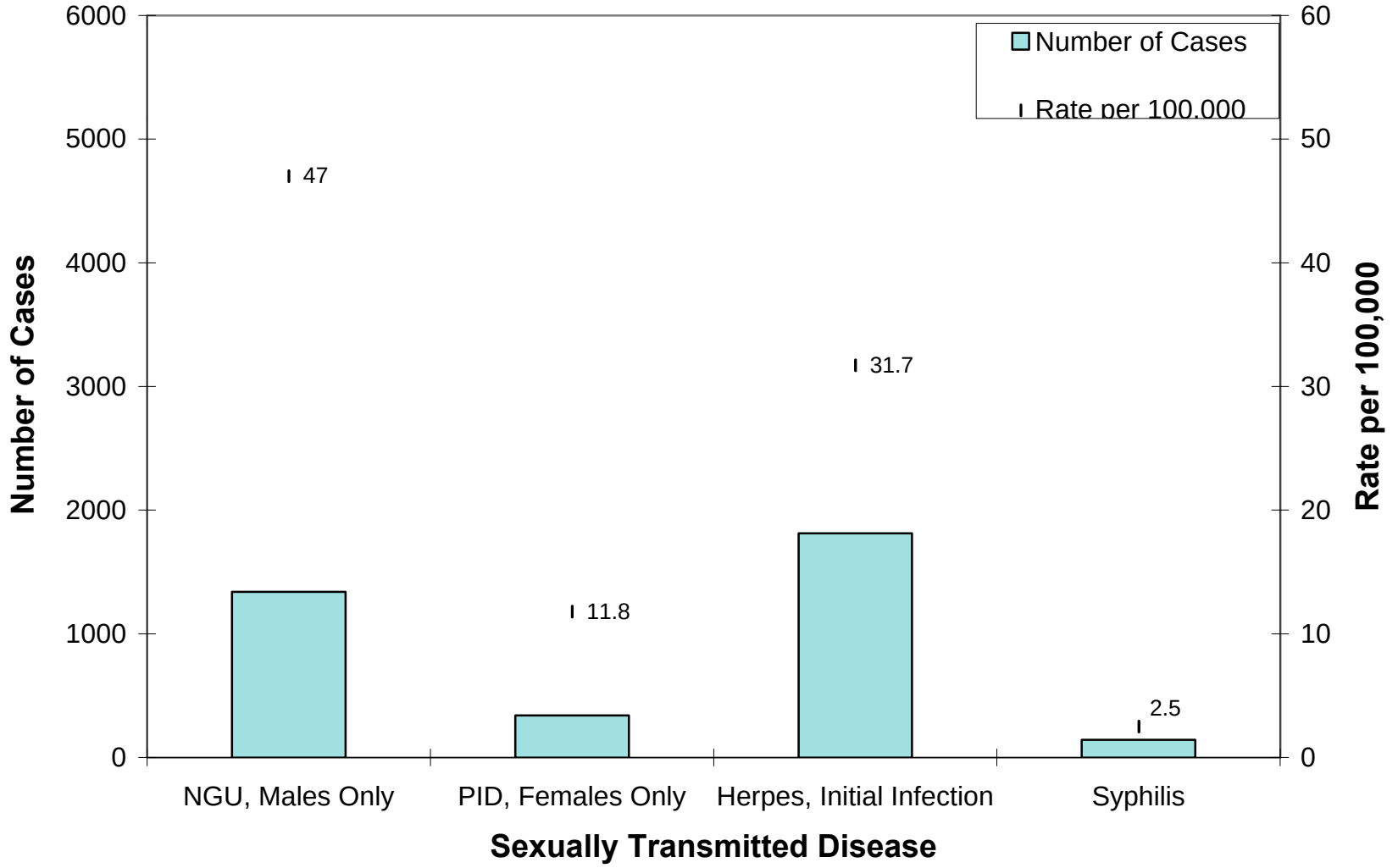
STATE OF WASHINGTON
STD MORBIDITY REPORT - 1998
REPORTED STD CASES AND INCIDENCE RATES BY DISEASE AND COUNTY

Table 5

1998										
COUNTY	POPULATION	PRIMARY & SECONDARY	EARLY LATENT	LATE LATENT	INITIAL HERPES	RATE/100,000	NGU	RATE/100,000	ACUTE PID	RATE/100,000
Adams	15,054	0	0	0	10	67	0	*	1	*
Asotin	19,857	0	0	0	16	81	1	*	0	*
Benton	141,053	0	0	0	32	23	6	9	11	16
Chelan	63,476	0	0	0	15	24	4	*	3	*
Clallam	66,124	0	0	0	27	41	0	*	6	18
Clark	312,669	2	1	0	42	13	40	26	18	11
Columbia	4,020	0	0	0	1	*	0	*	0	*
Cowlitz	92,876	0	0	0	7	8	5	11	0	*
Douglas	31,296	0	0	0	8	26	0	*	2	*
Ferry	7,177	0	0	0	0	*	0	*	0	*
Franklin	47,042	0	0	1	9	19	1	*	4	*
Garfield	2,238	0	0	0	0	*	0	*	0	*
Grant	69,813	0	0	0	11	16	0	*	1	*
Grays Harbor	69,599	0	0	0	23	33	0	*	0	*
Island	73,860	2	0	0	29	39	12	32	4	*
Jefferson	26,910	0	0	0	8	30	2	*	2	*
King	1,671,733	33	8	28	651	39	788	95	110	13
Kitsap	236,597	0	0	2	63	27	83	69	34	29
Kittitas	30,976	0	0	0	12	39	1	*	2	*
Klickitat	18,344	0	0	1	4	*	0	*	1	*
Lewis	67,774	0	0	2	18	27	0	*	2	*
Lincoln	8,986	0	0	0	0	*	1	*	0	*
Mason	47,681	0	1	6	13	27	5	21	1	*
Okanogan	37,453	0	0	0	13	35	2	*	0	*
Pacific	20,765	0	0	0	0	*	1	*	0	*
Pend Oreille	11,155	0	0	0	1	*	1	*	0	*
Pierce	703,636	2	0	15	208	30	169	48	18	5
San Juan	12,980	0	0	0	2	*	0	*	2	*
Skagit	99,175	0	0	1	26	26	4	*	8	16
Skamania	9,688	0	0	0	1	*	0	*	0	*
Snohomish	564,884	1	2	3	245	43	51	18	51	18
Spokane	417,691	1	0	3	68	16	107	52	15	7
Stevens	36,427	0	0	0	8	22	5	28	1	*
Thurston	205,456	0	0	4	55	27	18	18	13	12
Wahkiakum	3,786	0	0	0	1	*	0	*	0	*
Walla Walla	54,436	0	0	1	22	40	1	*	0	*
Whatcom	158,512	0	0	4	72	45	9	12	3	*
Whitman	40,325	2	0	0	10	25	0	*	8	41
Yakima	212,013	1	4	11	81	38	21	20	18	17
STATE TOTAL	**5,713,537**	**44**	**16**	**82**	**1,812**	**32**	**1,338**	**47**	**339**	**12**
		Rate:0.8	**Rate:0.3**	**Rate:1.4**				Male Population		Female Population
								2,844,993		**2,868,544**

*Rates are not calculated from 0 to 4 cases because they are unreliable

Figure 12. Number of Cases and Incidence Rates*, Select STDs, Washington State, 1998



* This is the crude rate, not adjusted for age.

Numerator: Reported cases of STDs.
Denominator: Washington State Adjusted Population Estimates, DSHS, June 1997.

Washington State Department of Health
STD/TB Services
IDRH Assessment Unit

GLOSSARY

Age-Specific Incidence Rate - A rate for a specified age group. The numerator, e.g., reported cases, and denominator, e.g., mid-year population, refer to the same age group. Age-specific incidence rates allow for the comparison of disease rates across age groups. If age is unknown, it is not included in the calculation of this rate. If the number of unknown data for age is greater than 2%, caution should be used in inference. This rate can also be calculated by gender to account for the different disease distribution for males and females.

Assumptions - It is assumed that the cases reported from year to year are independent of each other. One violation of this assumption could be if a person who has an STD one year is more likely to have an STD the following year. Also, repeat episodes of the same STD by the same person are not excluded from the numerator count; it is felt that these numbers are not large enough to significantly impact the calculated STD rates.

Case - An episode of disease. If a person is diagnosed with more than one STD in a year, each infection is counted separately.

Confidence Interval - The confidence interval (CI) evaluates the influence of chance or random variability on the statistical estimate or rate (Selvin, 1996). Surveillance data, even based on complete counts, may be affected by chance. If variation in the occurrence of the disease is random and not affected by differential diagnosing or reporting, then confidence intervals may be calculated to facilitate comparisons over time, between groups, or between geographic locations (e.g., counties). In this situation, calculated confidence intervals should be based on a Poisson probability distribution. In general, if confidence intervals for two separate rates overlap, there is no statistically significant difference between the two rates.

Narrow confidence intervals for rates indicate with greater certainty that the calculated rate is a reliable approximation of the true rate, while wide confidence intervals signal greater variability and less certainty that the calculated rate is a good estimate of the true rate.

Crude Rate - The number of events, e.g., reported cases, divided by the total mid-year population. This rate is not “adjusted” or “standardized” for different population discrepancies. In general, no rates should be calculated if the number of events is fewer than five because the rates are considered unstable.

Sources of Data Errors - Errors could exist in the data due to under-diagnosing, under-reporting, inability of certain populations to access medical services, error in laboratory reporting, or differential reporting or screening by source of care. Therefore, the calculated STD rates may be under-estimated.

Data Limitations - Clinically diagnosed cases of STDs (with laboratory confirmation) may be missed through this surveillance system. Presumptively diagnosed cases may be missed through this surveillance system. However, clinical practice recommendations from the CDC state all bacterial STDs should receive laboratory confirmation. Depending upon diagnosing practices, completeness of reporting may vary by source of health care. Some items are known to be under-reported or misreported, e.g., race, ethnicity, and marital status.

Denominator - The lower portion of a fraction used to calculate a rate or ratio; usually, this is the mid-year population. The source for denominator data used in this report was: Washington State Adjusted Population Estimates, Department of Social and Health Services (DSHS), June 1997.

Incidence Rate - The number of new cases of a disease (not persons) in a given year divided by the total mid-year population (age and sex appropriate) as a rate per 100,000 population. Incidence rates allow comparisons between two or more populations by standardizing the denominator and are the most appropriate statistic to use when investigating differences between groups. If the disease under study varies by age, age-adjusted incidence rates should be used to compare disease incidence between two or more populations. Incidence rates are not calculated for numerators of less than five cases, including zero cases, because the calculated rate is unreliable and subject to wide confidence intervals.

Numerator - The upper portion of a fraction used to calculate a rate or a ratio, e.g., new cases identified and submitted by providers to local health jurisdictions and forwarded to the State Department of Health, STD/TB Services.

Race and Ethnicity - The STD confidential case report includes race and ethnicity as two separate categories. Race options include White, Black, Asian/Pacific Islander, American Indian/Alaska Native, and Other/Unknown. Ethnicity options include Hispanic, Non-Hispanic, and Unknown. Following the enumeration technique of the United States Census Department and the Washington State Center for Health Statistics, race and ethnicity are counted separately. For example, if a case report indicates “White” and “Hispanic”, the case is counted both as White and as Hispanic.

Unstable Rates - When the number of events and/or the size of the source population is small, rates exhibit wide random variability. The addition or deletion of a few cases can have a dramatic effect on the size of the calculated rate. Unstable rates result in wide confidence intervals --generally, the smaller the numbers, the wider the interval-- and reduces the ability to detect statistically significant differences.

VISTA - A menu-driven data analysis program in a Windows environment developed for public health assessment by the Seattle-King County Department of Public Health. When the analysis is defined, the software activates the appropriate numerator and denominator files, analyzes them using the Statistical Package for the Social Sciences (SPSS) and then displays the results in a Microsoft Excel spreadsheet. The spreadsheet can then be used to make a wide range of Excel charts and tables.

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